



# Problematic use or addiction? A scoping review on conceptual and operational definitions of negative social networking sites use in adolescents

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## ABSTRACT

The aim of this study was to assess the conceptual and operational descriptions of negative social networking site (SNS) use in adolescents. A search was conducted among four databases, following the guidelines set forth in the PRISMA-Scr. The search resulted in 1503 articles, of which 112 met the inclusion criteria. The results showed that the negative use of SNS has been conceptualised from two approaches: (1) the component model of addiction and (2) a cognitive-behavioural problematic use paradigm. Thirty-seven instruments assessing this problem were found, with the Bergen Facebook Addiction Scale and its adaptations being the most widely used ones. These instruments dimensions were vaguely defined and often overlapped with one another. In conclusion, no standardised theoretical framework exists to assess negative SNS use in adolescents. This lack of a theoretical definition makes it difficult to compare results among studies and determine the true extent of the problem.

## 1. Introduction

The rapid development of information and communication technologies has changed the lives of human beings in numerous ways. Today, interpersonal communication takes place largely in online environments due, in large part, to their accessibility and swiftness (Ostendorf et al., 2020). According to We are Social and Hootsuite (2022), 58.4% of Internet users from ages 16 to 70 use social networks. Additionally, the average time a person spends on SNS is 2.5 h. This massive and exponentially growing use has led to increased interest in studying this phenomenon and its impact on users' health and well-being.

The study of behaviours related to information and communication technology use originated with the research of Griffiths (1996) and Young (1996). At first, these authors labelled this phenomenon as 'Internet addiction', independently conceiving it as a pathological condition with characteristics similar to those of substance use. (Dahl & Bergmark, 2020; Dalal & Basu, 2016; Lopez-Fernandez, 2018; Tokunaga & Rains, 2016). Over the past two decades, the study of this concept has been approached from different paradigms and conceptualised with countless terms, including pathological use, problematic use,

compulsive use, use disorder, dependence, addiction and addiction disorder, among others (Dalal & Basu, 2016; Kuss et al., 2014). As a result of these disparities, numerous screening and diagnostic tools exist and are based on the authors' own theoretical understanding. The heterogeneity of instruments with various diagnostic criteria and cut-off points makes generalisations and comparisons difficult; it also diminishes confidence in the concept and the ability to distinguish between regular users and those in need of help (Dalal & Basu, 2016; Kuss & Griffiths, 2017; Petry et al., 2018). This hinders the development of a cohesive and systematic body of research and creates challenges and barriers as, it may be unclear whether these definitions and instruments address the same underlying construct (Tokunaga & Rains, 2016). Due to the lack of consensus, this article will use the term 'negative use' to encompass the various existing nomenclatures (i.e, compulsive use, addictive use, addiction, excessive use and problematic use). However, this new term is not intended to promote another umbrella term and is solely used when appropriate to encompass the aforementioned terms from a neutral perspective.

General problematic Internet use (GPIU) has primarily been approached from several paradigms. In their review Tokunaga & Rains, (2016) identified the following three categorizations of internet

*Abbreviations:* SNS, Social Networking Sites; GPIU, General Problematic Internet Use; SPIU, Specific Problematic Internet Use.

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negative use: 1) as analogous to a chemical addiction sharing a series of components, namely salience, tolerance, withdrawal, relapse, mood regulation and conflicts. (Griffiths, 2005); 2) as an impulse control disorder following the DSM-IV-TR criteria in which pathological gambling was classified under impulse control disorders (American Psychiatric Association, 2000) and; 3) an artifact of relational and relationship-building resource deficits in which a distinct pattern of Internet-related cognitions and behaviours result in negative life outcomes (Davis, 2001).

Only one specific problematic Internet use (video gaming) has been internationally recognised by the World Health Organisation's eleventh revision of the International Classification of Diseases, where video gaming disorder is identified as a health condition (World Health Organisation, 2021). However, in the appendix of the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (American Psychiatric Association, 2013), Internet gaming disorder is listed as a condition that requires further empirical and clinical research. Accordingly, in recent years, the field of specific problematic internet use (SPIU) has been the subject of considerable attention, and the number of theoretical models trying to explain this relationship has increased (Brand et al., 2022). For instance, the pathway model for cyberaddictions (Billieux, 2012) and smartphone use (Canale et al., 2021), the Interaction of Person-Affect-Cognition-Execution (I-PACE) model of Problematic Internet use (Brand et al., 2019), the compensatory internet use (Kardefelt-Winther, 2014) or models that emphasize Fear of Missing Out (FoMO) and metacognitions as key components in negative use of SNS (Casale et al., 2021; Fioravanti et al., 2021). In fact the latter SPIU (i.e., Problematic use of SNS) has gathered a lot of attention in the last few years.

Currently, there is no commonly accepted definition of 'social networking site'. Their rapidly changing nature caused social networks to be defined from a wide range of perspectives, making the creation of a static definition difficult (Bayer et al., 2020; Rhee et al., 2021). Empirical research now supports the idea that social networking is a way of being and relating to others (Kuss & Griffiths, 2017). Today's adolescents have grown up in a world where technology and social networks are integral parts of their lives. They create virtual spaces that respond to their need to belong and satisfy their needs for security, association, admiration and self-fulfilment.

However, a growing body of scientific evidence suggests that behavioural problems related to the use of social networks can lead to functional and psychological impairments in users (Kuss et al., 2014; Kuss & Griffiths, 2017; Lopez-Fernandez, 2018). This is of particular concern in childhood and adolescence. According to Pew Research Center (2021) more than 90% of individuals under the age of 18 use social networks, and almost half of these young people report being "almost constantly" connected to social networks (Pew Research Center, 2021).

As adolescence is a critical period for the development of health risk behaviours, the emergence of negative SNS use is of particular concern at this stage of life (Gámez-Guadix et al., 2013). Numerous studies have associated negative overall Internet use with psychosocial problems, such as increased social anxiety, higher levels of depression, a higher incidence of attention-deficit/hyperactivity disorder, increased loneliness, poorer psychosocial well-being, increased substance use behaviours and lower levels of family functioning (Fioravanti et al., 2020), life satisfaction and health related quality of life (Fioravanti, Probst, & Casale, 2020; Hussain & Griffiths, 2018; Machimbarrena et al., 2019; McCrae, Gettings, & Pursell, 2017; Pernsungnern, Pornnoppadol, Sitdhiraksa, & Buntub, 2014; Pontes, 2017; Schivinski et al., 2020; Tokunaga & Rains, 2016).

The aim of the present study was to synthesise the field of research regarding adolescents' negative use of SNS by examining the different conceptual and operational definitions and the instruments used to measure this problem. This objective stemmed from the lack of a conceptual mapping of this specific negative Internet use among

adolescents. The present study also aimed to develop a framework to help define and understand the complexity of negative SNS use. A scoping review was carried out to accomplish this goal, as the existing body of literature was highly heterogeneous and complex and, therefore, not amenable to a more precise systematic review (Peters et al., 2015).

We posed the following research questions:

- What is the dominant paradigm when it comes to analysing the negative use of social networking sites by adolescents?
- What dimensions are measured by the main instruments used in the literature to assess negative social networking sites use in adolescents?

## 2. Method

The research methods and reporting of the present scoping review were consistent with the guidelines set forth in the PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) (Tricco et al., 2018). This review's objectives, inclusion criteria and methods of analysis were specified in advance and documented in a protocol adapted from the PROSPERO (Prospective International Register of Systematic Reviews) protocol template (National Institute for Health Research, 2021). However, the review could not be registered, as PROSPERO does not currently accept registrations for scoping reviews, literature reviews or mapping reviews.

### 2.1. Identification of relevant studies

In March 2021, a systematic and comprehensive search was conducted using the following electronic databases: PsycInfo, Web of Science, Scopus and ProQuest. The search terms used can be found in Table 1:

Articles published between 2010 and 2021 were selected. To be included in the scoping review, studies needed to meet four eligibility criteria: (1) be primary research studies; (2) sample adolescents aged 11–17 years (or, if participants were older than 17 years, the mean age needed to be below 17); (3) be published in English or Spanish and (4) be published in peer-reviewed journals. Qualitative studies, theses, reports not published in academic journals, systematic reviews and meta-analyses were excluded. However, their reference lists were reviewed to locate potentially eligible studies.

### 2.2. Selection of studies

The flow chart in Fig. 1 shows the identification, screening, eligibility assessment and inclusion process of the selected studies in this review. The initial search identified articles from the databases listed above. Two articles identified through reference lists were added. All references (n = 1503) were imported into Excel, and the titles, abstracts

**Table 1**  
Search algorithm.

Concept	Term
Problem* (+term) us*	Social media
(+term) Addiction	Social network*
(+term) Disorder	Social network* sit*
Compulsive (+term) us*	SNS
Excessive (+term) us*	Facebook
(+term) misuse	Instagram
(+term) overus*	
(+term) abuse	
(+term) dependency	

Note: The concept and the key word chain rendered 63 distinct searches. An example of such would be "problem\* social media us\*" or "problem\* SNS us\*". The Boolean search term \* was used to capture small variants in the words usage and networking.

## PRISMA 2020 flow diagram for new systematic reviews

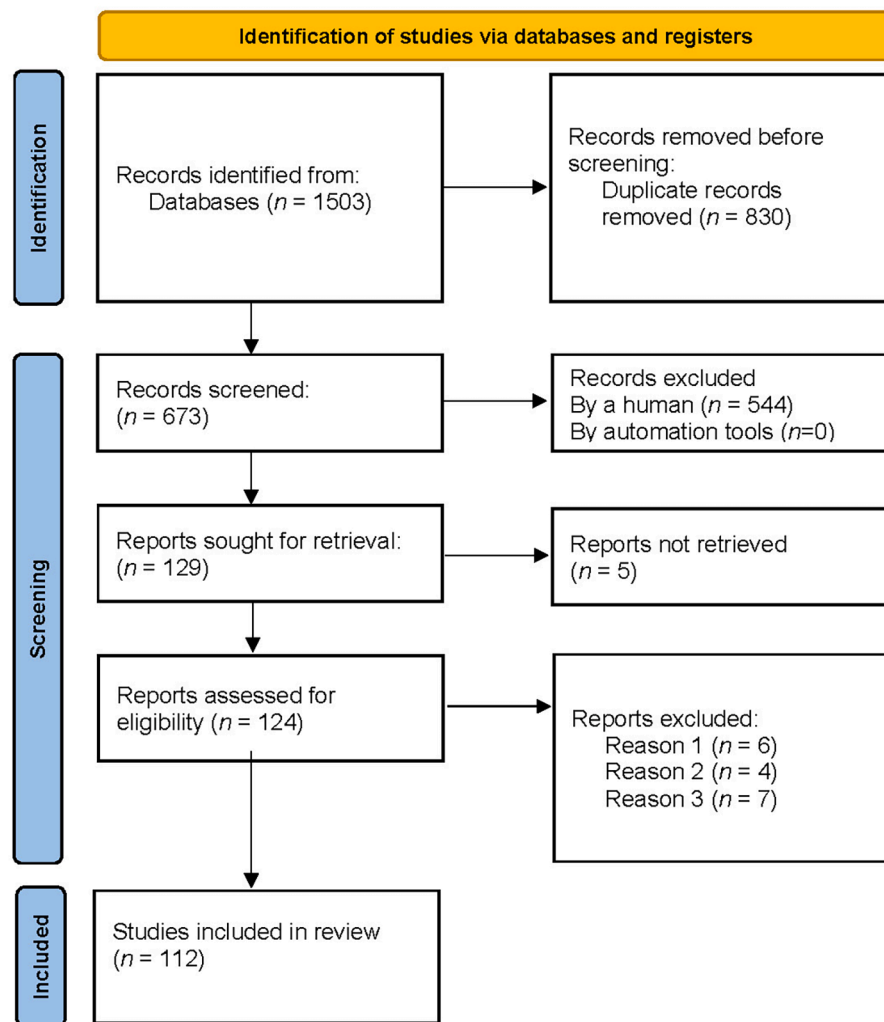


Fig. 1. PRISMA diagram of the study selection process. Note: Reason 1: non-primary empirical studies; Reason 2: studies in a language other than English or Spanish; Reason 3: no access; Reason 4: no peer review.

and DOIs of all references were checked for duplicates, which were removed. After the removal of duplicates, 673 total articles were screened, and the titles and abstracts of all articles were assessed to pre-select articles that could meet the three eligibility criteria. To minimise potential errors and bias in the selection process (Whiting et al., 2016), two independent researchers (M.N.V. and J.M.M.) evaluated all titles and abstracts to pre-select articles that could potentially meet the three eligibility criteria. If an abstract did not allow assessment of study eligibility, the full text was scanned. At this stage, 544 items were removed, leaving a total of 129 pre-selected items. After an in-depth reading of the pre-selected articles, 17 were discarded because they did not meet all eligibility criteria. The second researcher reviewed the final selection, and potential disagreements about a study's final inclusion were solved by a majority consensus among the authors of the manuscript. This procedure left a total of 112 articles to be included in the study.

### 2.3. Data extraction

Appendix 1 presents a summary of all the information extracted from the 112 articles selected for the review. Specifically, the article number, the reference, the sample (N, sex, age, mean age and country), the

instrument used and the variables measured in each study are specified.

## 3. Results

### 3.1. Study characteristics

The studies were conducted in 31 different countries. The weighted percentage of female participants was 51.04%. Studies included ages from 8 to 23 years. The weighted mean age was 13.98 (SD = 0.997) years.

### 3.2. Analysis of the instruments used to measure problematic SNS use

Table 2a and b shows each instrument used to measure negative SNS use. For each instrument, the paradigm, its adaptations and the items in which it has been used, a general description of the instrument, cut-off points, reliability and validity are listed.

Twenty original instruments were found. 17 fell into the addiction paradigm (used in 105 studies), one fell into the cognitive-behavioural paradigm (used in 7 studies) and two instruments did not fall into any clearly defined paradigm.

**Table 2a**

Scales used to measure negative SNS use (original scale, adaptation name and general description).

PSMU INSTRUMENT	Questionnaire / adaptation name and studies in which is used	GENERAL DESCRIPTION
Bergen Facebook addiction Scale (Andreassen et al., 2012)	Bergen Facebook Addiction Scale (BFAS) (Andreassen et al., 2012) (21,27,30,37,43,44,49,50,51,56,60,66,73,75,76,97,100,103)	6 items and 6 factors; salience, mood modification, tolerance, withdrawal, conflict and relapse. (30,37,43,49,50,56,60,66,73,76,97,100,103) Long version; 18 items (6 factors; 3 items per each). (21,27,44,51,75)  Likert Scale: 1 = Very rarely and 5 = Very often (21,27,30,37,43,44,49,50,51,56,60,66,73,75,76,97,100,103)
Bergen Instagram Addiction Scale (Yurdagül et al., 2021) (38)	Bergen Instagram Addiction Scale (Yurdagül et al., 2021) (38)	6 items and 6 factors; salience, mood modification, tolerance, withdrawal, conflict and relapse.  Likert Scale: 1 = Very rarely and 5 = Very often  Adaptation was done replacing the word 'Facebook' with 'Instagram'
Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al., 2016) (6,9,13,14,26,31,39,48,57,78,80,81,83,106)	Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al., 2016) (6,9,13,14,26,31,39,48,57,78,80,81,83,106)	6 items and 6 factors; salience, mood modification, tolerance, withdrawal, conflict and relapse. (6,9,13,14,26,31,39,48,57,78,80,81,83,106)  Likert Scale: 1 = Very rarely and 5 = Very often (6,9,13,14,26,31,39,48,57,78,80,81,83,106)
Bergen Social Networking Addiction Scale (BSNAS) (Gugliandolo et al., 2020) (10)	Bergen Social Networking Addiction Scale (BSNAS) (Gugliandolo et al., 2020) (10)	18 items and 6 factors (3 items per each): salience, mood modification, tolerance, withdrawal, conflict and relapse.  Likert Scale: 1 = Very rarely and 5 = Very often  Adaptation of Facebook addiction scale (Andreassen, Torsheim et al. 2012)
Adaptation of BFAS (68)	Adaptation of BFAS (68)	4 items
Social Media Disorder Scale (SMDS) (van den Eijnden et al., 2016)	Social Media Disorder Scale (SMDS) (van den Eijnden et al., 2016) (3,5,7,8,9,12,15,16,17,18,19,20,23,33,45,58,59,62,74,79,86,87,91,95,96,105,112)	9 items and 9 factors: Preoccupation, Tolerance, Withdrawal, Persistence, Escape, Problems, Deception, Displacement, and Conflict. Dichotomous (yes/no) response scale (9,5,7,8,15,16,20,23,33,45,62,79,86,87,91,96,102)  Six point Likert scale (3) Five point Likert scale (12,17,18,19,59,74,95) Four point Likert scale (105)  Likert scale (58)
Facebook Intrusion Questionnaire (FIQ) (Elphinston & Noller, 2011)	Facebook Intrusion Questionnaire (FIQ) (Elphinston & Noller, 2011) (32, 54,99)	8 factors and 8 items: Cognitive salience, behavioral salience, interpersonal conflict, conflict with other activities, euphoria, loss of control, withdrawal, relapse and reinstatement.  7 point Likert scale: 1 = strongly disagree to 7 = strongly agree (32)  1 = never to 7 = always (54,99)

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Table 2a (continued)

PSMU INSTRUMENT		GENERAL DESCRIPTION
Original Scale	Questionnaire / adaptation name and studies in which is used	
	Adaptation of (FIQ) to SNS (2,28,46,110)	8 factors and 8 items: Cognitive salience, behavioral salience, interpersonal conflict, conflict with other activities, euphoria, loss of control, withdrawal, relapse and reinstatement.  7 point Likert scale: 1 = strongly disagree to 7 = strongly agree (2) 1 = never to 7 = always (28,46,110)
Generalized Problematic Internet Use Scale 2 (GPIUS2) (Caplan, 2010)	A subscale from the Generalized Problematic Internet Use Scale2 (GPIUS2) (49)	Preference for Online Social Interaction (POSI) (3 items)
	Adaptation of GPIUS2 to Facebook (35,41,71,77,92)	15 items (Five sub-scales; 3items per each) POSI, mood regulation, cognitive preoccupation, compulsive use and negative outcomes. 7- point Likert scale that ranges from strongly disagree to strongly agree (41,71) 8-point scale (1 = definitely disagree to 8 = definitely agree) (35,77,92)
	Adaptation of GPIUS2 to Instagram (107)	15 items (Five sub-scales; 3items per each) POSI, mood regulation, cognitive preoccupation, compulsive use and negative outcomes.  8-point scale (1 = definitely disagree to 8 = definitely agree) (107)
Internet addiction Test (IAT) (Young, 1998)	The SMAS (Al-Menayes, 2015) (9) Adaptation of IAT to social media	Original scale: 20items; Likert scale (0 not apply; 5 always).  3 factors: 4 items in factor 1. 4 items in factor 2 and 2 items in factor 3 (9)  Likert Scale: 1 = strongly disagree and 5 = strongly agree (9)
	Four items adapted from IAT (47,90)	Likert scale: 1 = completely dis- agree; 5 = completely agree (47,90)
	The measures for social media addiction were altered from IAT (64)	No available
	Short Internet Addiction Test Modified for Social Networks Use Disorder (Pawlikowski et al., 2013) (36)	4 out of originally 12 items were applied  Two factors (2 items per each): loss of control/time management and social problems/ craving  Likert Scale: 1 = Never and 5 = Very often
	A version of the Internet Addiction Test (IAT) (Widyanto & McMurrans, 2004) adapted to Facebook (53)	20 items Likert scale: from1 'rarely' to 5 'always'.
The Adaptation of social media addiction scale of (Özgür, 2013) (88) is an adaptation of Social media addiction scale (Cam & İşbulan, 2012) which is an adaptation of IAT.	19 positive items comprising one dimension  Six-point Likert-type scale	
Adaptation of the scale of (Fioravanti et al., 2012) based in IAT (72)	9 items5- point scale ("1" "Strongly Disagree" "5" "Strongly Agree")	
The scale used in article 98 is a scale based in the adaptation of the IAT from (Guzzo et al., 2013)	6 items (tolerance, withdrawal, use of increasing amounts, repeated attempts to quit, activities given up in order to use, too much time spent on use, physical problem related to use) Likert scale (0 meant never, 1 meant rarely,2 sometimes, 3 often and 4 always)	

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Table 2a (continued)

PSMU INSTRUMENT		GENERAL DESCRIPTION
Original Scale	Questionnaire / adaptation name and studies in which is used	
Facebook Addiction Scale (FAS) (Koc & Gulyagci, 2013)	Adaptation of Facebook Addiction Scale (FAS) to Social networking (4,52, 69,84,109)	8 items: Cognitive salience, behavioral salience, conflict with other activities, euphoria, loss of control, withdrawal, relapse and reinstatement. Likert scale: 1 (not true) to 5 (extremely true) (69,84,109)  Five-point Likert scale from 1 (never) to 5 (always) (4)
The Social Media Addiction Scale (SMAC) (Sahin, 2018)	The Social Media Addiction Scale (SMAC) (Sahin, 2018) (25,85,101,111)	29 items and 4 subscales: tolerance, virtual communication, virtual problem and virtual information  5-point Likert scale (1 = not appropriate to 5 = quite appropriate) (25) 5-point Likert scale "strongly agree" to "strongly disagree" (85,111) 5-point Likert type scale (101)
The Social Media Use Questionnaire (SMUQ) (Xanidis & Brignell, 2016)	The Social Media Use Questionnaire (SMUQ) (Xanidis & Brignell, 2016) (61,89)  Adaptation of SMUQ to Instagram (29,34)	9 items and 2 factors: withdrawal and compulsion  5-point Likert scale from "never" to "always" (89)  9 items and 2 factors: withdrawal and compulsion 5-point Likert scale from "never" to "always" (29,34)
Compulsive Internet Use Scale (CIUS) (Meerkerk, van den Eijnden, Vermulst, & Vermulst, 2009)	Adaptation of CIUS to social media (63,94,102)  Adaptation of CIUS to Facebook (42)	Original scale: 14 items with a 5-point scale: 0, never to 4, very often.  7 items (63) 6 items: loss of control, preoccupation, withdrawal symptoms, coping and conflict (social problems and problems fulfilling responsibilities in school). (94,102) 5-point Likert scale from 'never' (1) to 'very often' (5) (94,102)  5-point Likert scale (63)  6 items  Unproblematic, low problematic level, medium problematic level and high problematic level in the first 4 items and Always, very often, sometimes, rarely and never in the last two items.
Questionario de Adicción a Redes Sociales (ARS) (Escurrea-Mayaute & Salas-Blas, 2014)	Questionario de Adicción a Redes Sociales (ARS) (Escurrea-Mayaute & Salas-Blas, 2014) (11)  Short versión of ARS (22)	24 items and 3 dimensions: obsession with social media (items 1–10), lack of personal control over social media use (items 11–16) and excessive use of social media (items 17–24)  Likert scale (never, rarely, sometimes, almost always and always)  6 items  5-point Likert scale
Social Media Addiction Test (S-MAT) (Pernsunger et al., 2014)	Social Media Addiction Test (S-MAT) (Pernsunger et al., 2014) (65,82)	16 items measuring: excessive use of social media, loss of control over social media usage and functional impairment (65,82) 4-point scale (not at all, not really, maybe right, and absolutely) ranging from 0 to 3 (65,82)
The Risk of Addiction to Social Networks Scale (Cr.A.R.S.) (Vilca & Vallejos, 2015)	The Risk of Addiction to Social Networks Scale (Cr.A.R.S.) (Vilca & Vallejos, 2015) (70)	43 items and 7 dimensions: loss of control, abstinence syndrome, decreased academic performance, mood modification, dependency, loss of interest in other activities and conflicts in the social sphere.

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Table 2a (continued)

PSMU INSTRUMENT		GENERAL DESCRIPTION
Original Scale	Questionnaire / adaptation name and studies in which is used	
		five-points Likert scale ranging from never to always
Social Network Addiction Scale (SNAS) (Gökdaş & Kuzucu, 2019)	Social Network Addiction Scale (SNAS) (Gökdaş & Kuzucu, 2019) (55)	10 items and 3 factors: Control difficulty, Negativeness in Social Relations and Decrease Functions  5-point- Likert form ranked as 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, 5 = Very Often
Social media addiction scale for adolescents (SMASA) (Özgenel et al., 2019)	Social media addiction scale for adolescents (SMASA)(Özgenel et al., 2019) (24)	9 item scale; one-factor structure 5-Likert type scale
The Social Network Site Addiction Proneness Scale (SAPS) (Jung & Kim, 2014)	The Social Network Site Addiction Proneness Scale (SAPS)(Jung & Kim, 2014) (1)	24 items and four factors: preoccupation and tolerance, avoidance of negative emotions, virtual life orientation and withdrawal, and disturbance of adaptive life and control failure  five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree)
Social Media Addiction Scale (SMAS) (Tutgun-Ünal, 2016) (2015)	Social Media Addiction Scale (SMAS) (Tutgun-Ünal, 2016) (108)	41 items with 5 point - likert scale has four dimensions (Occupation, mood modification, relapse and conflict).
Social Networking Status Scale (SNSS) (Arslan & Kirik, 2013)	Adaptation of SNSS consist in use one factor of the scale (addiction factor) (67)	25 items 5-point Likert scale
The social media usage scale (SMUS) (Küçükali, 2016)	Adaptation of SMUS (40)	Original scale: 15 items  13 items (40)  5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree)
Scale not available from Lee (2011)	Scale created by Lee, (2011) (93)	5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree),
Scale not available from Chon et al., 2014)	Scale created by Chon et al., (2014) (104)	5 items (overuse, withdrawal, intolerance, awareness of problem)  5-point scale (1 = not at all, 5 = all the time)

Note: Numbers in parenthesis display the number of study as indicated in Appendix 1. For references of each assesment tool indicated in this table please refer to Appendix 1.

**Table 2b**

Scales used to measure negative SNS use (Adaptation name, cutoff scores and reliability and validity indicators).

Questionnaire / adaptation name and studies in which is used	CUTOFF	RELIABILITY	VALIDITY	
			EFA	CFA
Bergen Facebook Addiction Scale (BFAS) (Andreassen et al., 2012) (21,27,30,37,43,44,49,50,51,56,60,66,73,75,76,97,100,103)	Original Scale: did not define specific cutoff. However they suggest to use a polythetic scoring scheme (e.g., scoring 3 or above on at least four of the six items) or a monothetic scoring key (e.g., scoring 3 or above on all six items) Cutoff 12 points (range 6–30) (e.g. scoring 3 or above on at least four of the six items) (60,66,97) Cutoff 14 points (range 6–30) (30) Cutoff 16 points (range 6–30) (56)  Cutoff 42 points (e.g. scoring 3 or above on at least four of the six items) (range 18–90) (44)  Mild addiction: 21–39 (51) Moderate addiction: 40–69 (51) Severe addiction: 70–90 (51) (range 18–90)  3 or more on at least four items on the six items (73)  3 or above for all items (76)  12 or more items as 4 (often) or 5 (very often) were grouped as FB addicted (44) Not available (21,27,37,43,49,50,75,100,103)	Yes 0.93 (21) 0.61 (37)	(27) Salience and tolerance (5 items) Relapse (2 items) Conflict (5 items) Mood modification (3 items) Withdrawal (3 items)	Yes (21,27,44,49,60)
Bergen Instagram Addiction Scale (Yurdagül et al., 2021) (38)	Not available	Yes 0.83		Yes
Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al., 2016) (6,9,13,14,26,31,39,48,57,78,80,81,83,106)	Original Scale: did not define specific cutoff. Cutoff above 19 (6–30) (6,9,48,57,78,80,106) Not available (13,14,26,31,39,81,83)	Yes 0.86 (6) 0.70 (14)	No	Yes (9,48,80,83,106)
Bergen Social Networking Addiction Scale (BSNAS) (Gugliandolo et al., 2020) (10)	Not available	Yes 0.94	No	Yes
Adaptation of BFAS (68)	Not available	No	No	Yes (68)
Social Media Disorder Scale (SMDS) (van den Eijnden et al., 2016) (3,5,7,8,9,12,15,16,17,18,19,20,23,33,45,58,59,62,74,79,86,87,91,95,96,105,112)	Original scale: five or more cut-off point Cutoff: five or more (7,15,20,23,33,87) Cutoff: six or more (45,96,16) Not available (3,5,9, 8,12,17,18,19,58,59,62,74,86,91,95,105,112,79)	Yes 0.98 (3) 0.57 (15,112)	No	Yes (9,18,20,33,58,59,79)
	Not available (32, 54,99)		No	Yes (32)

(continued on next page)



Table 2b (continued)

Questionnaire / adaptation name and studies in which is used	CUTOFF	RELIABILITY	VALIDITY	
			EFA	CFA
Facebook Intrusion Questionnaire (FIQ) (Elphinston & Noller, 2011) (32, 54,99)		Yes 0.90 (32) 0.85 (54)		
Adaptation of (FIQ) to SNS (2,28,46,110)	Not available (2,28,46,110)	Yes 0.78 (2) 0.87 (28,46)	No	Yes (2,110)
A subscale from the Generalized Problematic Internet Use Scale2 (GPIUS2) (49)	Not available (49)	Yes 0.87 (49)	No	No
Adaptation of GPIUS2 to Facebook (35,41,71,77,92)	Not available (35,41,71,77,92)	Yes 0.80 in cognitive preoccupation (41,71) 0.91(35,92)	No	Yes (41,71,77)
Adaptation of GPIUS2 to Instagram (107)	Not available (107)	Yes 0.79(107)	No	No
The SMAS (Al-Menayes, 2015) (9) Adaptation of IAT to social media	Original scale: 20 and 39: have control over their Internet use 40 and 69: problematic Internet use 70–100: addictive use  Not available (9)	Yes (9) (factor 2; 0.76) (factor 3 0.43)	No	Yes (9)
Four items adapted from IAT (47,90)	Not available (47,90)	Yes 0.90 (47)	No	Yes (90)
The measures for social media addiction were altered from IAT (64)	Not available	Yes greater than0.70	No	No
Short Internet Addiction Test Modified for Social Networks Use Disorder (Pawlikowski et al., 2013) (36)	Not available	Yes 0.84 (36)	No	No
A version of the Internet Addiction Test (IAT) (Widyanto & McMurran, 2004) adapted to Facebook (53)	Cutoff: Average or normal Facebook use: 20–39 Occasional or frequent problems due to Facebook use: 40–69 Significant problems subsequent to Facebook use: 70–100.	Yes 0.89	No	No
The Adaptation of social media addiction scale of (Özgür, 2013) (88) is an adaptation of Social media addiction scale (Cam & İşbulan, 2012) which is an adaptation of IAT.	Not available	Yes 0.91 (88)	No	No (88)
Adaptation of the scale of (Fioravanti et al., 2012) based in IAT (72)	Not available	Yes 0.87 (72)	No	No
The scale used in article 98 is a scale based in the adaptation of the IAT from (Guzzo et al., 2013)	It was assumed that a pupil who reported a diagnostic criterion at least sometimes was affected by the corresponding symptom: since the DSM-IV declares that meeting 3 or more diagnostic criteria can be considered dependence, we dichotomized the variable PSNSU as having at least 3 such symptoms.	Yes 0.76 (98)	No	No
Adaptation of Facebook Addiction Scale (FAS) to Social networking (4,52, 69,84,109)	Original scale: higher scores indicating a greater level of addiction Participants who scored in the 10th decile of scores	Yes (109)	No	Yes (4,109)

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Table 2b (continued)

Questionnaire / adaptation name and studies in which is used	CUTOFF	RELIABILITY	VALIDITY	
			EFA	CFA
	(i.e., OSNA score $\geq 24$ ) were classified as OSNA cases at baseline, and the same cut-off value was used to classify cases at follow-up (52) Divided the students' scores into four quartile groups, and those in the fourth quartile (i.e., OSNA score $\geq 21$ ) were defined as having OSNA (69) Not available (4,84,109)	0.86 (4,84) 0.89 (52)		
The Social Media Addiction Scale (SMAC) (Şahin, 2018) (25,85,101,111)	Not available (25,85,101,111)	Yes 0.90 (25) 0.72 (101)	Yes (85) (111) 1 Satisfaction with being connected to social networks 2 Problems 3 Obsession to be informed 4 Need/Obsession to be connected	Yes (85,111)
The Social Media Use Questionnaire (SMUQ) (Xanidis & Brignell, 2016) (61,89)	Not available (61,89)	Yes 0.85 (61) 0.90 (89)	No	No
Adaptation of SMUQ to instagram (29,34)	Not available (29,34)	Yes 0.86 (34) 0.89 (29)	No	Yes (29)
Adaptation of CIUS to social media (63,94,102)	The scores were dichotomized into 'problematic video-gaming/ social media use' (mean score $\geq 3$ ), and 'no problematic video-gaming/social media use' (94) Not available (63,102)	Yes 0.82 (63,94) 0.88 (102)	No	Yes (102)
Adaptation of CIUS to Facebook (42)	Not available (42)	No	No	No
Cuestionario de Adicción a Redes Sociales (ARS) (Escurra-Mayaute & Salas-Blas, 2014) (11)	Not available	Yes 0.909 (11)	No	No
Short versión of ARS (22)	Age 1: 11–14/ Age 2: 15–17/ Age 3: 18–25 Occasional: Age 1 (7 or less) Age 2 (8 or less) Age 3 (18 or less) Regular: Age1 (8–19) Age2 (9–24) Age3 (19–27) In risk: Age1 (18–26) Age2 (25–27) Age3 (28–29) Problematic: Age1 (27 or more) Age2 (27 or more) Age3 (30 or more) (22)	No	No	Yes (22)
Social Media Addiction Test (S-MAT) (Pernsungnern et al., 2014) (65,82)	Cutoff points: 0–19 = not addicted, 20–29 = almost addicted, and 30 and over = addicted (65,82)	Yes 0.90 (65,82)	No	No
The Risk of Addiction to Social Networks Scale (Cr.A.R.S.) (Vilca & Vallejos, 2015) (70)	Not available	Yes 0.96 (70)	No	Yes (70)
Social Network Addiction Scale (SNAS) (Gökdaş & Kuzucu, 2019) (55)	Not available	Yes 0.87 (55)	No	Yes (55)

(continued on next page)

Table 2b (Continued)

Questionnaire / adaptation name and studies in which is used	CUTOFF	RELIABILITY		VALIDITY	
		Yes	No	EFA	CFA
Social media addiction scale for adolescents (SMASA) (Ozgenel et al., 2019) (24)	Not available	Yes 0.91 (24)	No	No	No
The Social Network Site Addiction Proneness Scale (SAPS)(Jung & Kim, 2014) (1)	Not available	0.94 (1)	No	No	No
Social Media Addiction Scale (SMAS) (Tugun-Umal, 2016) (108)	No addiction ≤ 73 Low addiction 74–106 Medium addiction 107–139 High addiction 140–172 Too much 173–205	Yes 0.97 (108)	No	No	No
Adaptation of SNSs consist in use one factor of the scale (addiction factor) (67)	Not available	Yes 0.94 (67)	No	No	No
Adaptation of SMUS (40)	Not available	Yes 0.72 (40)	No	Yes (40)	No
Scale created by Lee (2011) (93)	Not available	Yes 0.84 (93)	No	No	No
Scale created by Chon et al., (2014) (104)	Not available	Yes 0.87 (104)	No	No	No

Note: Numbers in parenthesis display the number of study as indicated in Appendix 1. For references of each assessment tool indicated in this table please refer to Appendix 1.

### 3.3. Analysis of the models and dimensions of measures of negative SNS use

The included studies proposed different models, each of which incorporated anywhere from one to nine different dimensions (Table 3).

First, the dimensions of the scales used to measure the negative use of social networks were extracted. In total, 11 dimensions were found (Table 3). The definitions and items in each dimension were also analysed (Appendix 2). The dimensions included in the 'others' column could not be catalogued because the authors either did not provide a clear definition of the concept or did not provide the items with which the dimension was measured.

Conflict was the most frequently analysed dimension (in ten of the scales). This referred to use-related problems that affected the user and those around him/her (interpersonal conflict) and those that only affected the individual (intrapsychic conflict). Nine scales measured preoccupation or salience (i.e., when the activity became the most important activity in the person's life and dominated their thinking, feelings and behaviour). Eight scales measured loss of control and withdrawal (loss of control refers to the inability to control or regulate access to social networks, while withdrawal refers to the unpleasant feelings and/or physical or psychological effects that occur when a particular activity is suddenly stopped or reduced). Seven scales measured the user's change in mood related to the subjective experience that occurs as a consequence of using social networks. Five scales measured relapse and tolerance (relapse refers to efforts made to reduce social network use without success, whereas tolerance refers to the process by which more frequent use is required to achieve the above effects). Two of the scales measured isolation (in terms of lifestyle changes in order to be connected for longer periods of time on social networks), such as the loss of interest in hobbies or other leisure activities.

Additionally, three dimensions were each found to be used in only one instrument. Deception was included in the Social Media Disorder Scale (van den Eijnden et al., 2016), and it refers to lying or covering up behaviours related to Internet gaming to others, usually family members, friends or significant others (Petry et al., 2014). POSI was defined by Caplan (2010) as the belief that online relationships are safer, more comfortable, more effective and less threatening than face-to-face interactions. Finally, mood regulation refers to the use of the Internet to reduce feelings of isolation or emotional distress (Caplan, 2010).

## 4. Discussion

The aim of this study was to synthesise the field of research regarding negative social network use in adolescents by examining the different conceptual and operational definitions as well as the instruments used to measure this problem. Overall, the results of this scoping review support the lack of unanimity and the heterogeneity of the definitions in previous studies regarding technology-related behaviour (Kuss et al., 2014; Petry et al., 2018; Tokunaga & Rains, 2016). The construct of social network addiction has been the dominant paradigm to date, although it was created from an atheoretical perspective, (Kuss et al., 2014) under the framework of substance abuse, as formulated by the APA (2013), and Griffiths's (2005) six-component model. However, due to the lack of a theoretical basis for conceptualisation, there is still no standard model for the assessment of this problem.

After the addiction paradigm the next most used has been the cognitive-behavioral model postulated by Caplan (2010) which includes five main dimensions: preference for online social interaction (POSI), mood regulation, cognitive preoccupation, compulsive use and negative outcomes. This model is conceptualized as a distinct pattern of Internet-related cognitions and behaviours that result in negative life outcomes (Davis, 2001).

**Table 3**  
Dimensions of measures of PSMU.

Measures/Scales	Conflict	Preoccupation	Loss of control	Withdrawal	Mood modification	Relapse	Tolerance	Displacement	Deception	Preference for online social interactions	Mood regulation	Others
9 Factors												
Social media Disorder Scale (SMDS) (van den Eijnden et al., 2016)	Yes *Conflict and Problems	Yes	No	Yes	Yes *Escape	Yes *Persistence	Yes	Yes	Yes	No	No	
8 Factors												
Facebook Intrusion Questionnaire (FIQ) (Elphinston & Noller, 2011)	Yes * Conflict with other activities and interpersonal conflict	Yes *Cognitive salience and behavioral salience	Yes	Yes	Yes *euphoria	Yes *Reinstatement	No	No	No	No	No	
Facebook Addiction Scale (FAS) (Koc & Gulyagci, 2013)	Yes * Conflict with other activities	Yes *Cognitive salience and behavioral salience	Yes	Yes	Yes *euphoria	Yes * Relapse and Reinstatement	No	No	No	No	No	
7 Factors												
The Risk of Addiction to Social Networks Scale (Cr.A.R.S.) (Vilca & Vallejos, 2015)	Yes * Decreased academic performance and *conflicts in the social sphere(a)	Yes *Dependency	Yes	Yes *Abstinence syndrome	Yes	No	Yes (b)	Yes * Loss of interest in other activities	No	No	No	
6 Factors												
Bergen Facebook addiction Scale (Andreassen et al., 2012)	Yes	Yes *Salience	No	Yes	Yes	Yes	Yes	No	No	No	No	
Compulsive Internet Use Scale (CIUS) (Meerkerk et al., 2009)	Yes *social problems and problems fulfilling responsibilities in school	Yes	Yes	Yes	Yes * Coping	No	No	No	No	No	No	
5 Factors												
Generalized Problematic Internet Use Scale 2 (GPIUS2) (Caplan, 2010)	Yes * Negative outcomes	Yes * Cognitive preoccupation	Yes *Compulsive use	No	No	No	No	No	No	Yes	Yes	
4 Factors												
The Social Media Addiction Scale (SMAC) (Sahin, 2018)	No	No	No	No	No	No	No	No	No	No	No	-Virtual communication -Virtual problem -Virtual information -Virtual tolerance -Virtual life orientation
The Social Network Site Addiction	No	Yes	No	Yes	No	No	Yes	No	No	No	No	

(continued on next page)

Table 3 (continued)

Measures/Scales	Conflict	Preoccupation	Loss of control	Withdrawal	Mood modification	Relapse	Tolerance	Displacement	Deception	Preference for online social interactions	Mood regulation	Others
Proneness Scale (SAPS) (Jung & Kim, 2014)												-Avoidance of negative emotions - Disturbance of adaptive life and control failure Occupation
Social Media Addiction Scale (SMAS) (Tutgun-Ünal, 2016)	Yes	No	No	No	Yes	Yes	No	No	No	No	No	
3 Factors												
Cuestionario de Adicción a Redes Sociales (ARS) (Escurra-Mayautte & Salas-Blas, 2014)	Yes * Lack of personal control over social media use (c)	Yes * Obsession with social media	Yes *Excessive use of social media	No	No	No	No	No	No	No	No	
Social Network Addiction Scale (SNAS) (Gökdaş & Kuzucu, 2019)	Yes * Decrease Functions	No	Yes * Control difficulty	No	No	No	No	No	No	No	No	Negativeness in Social Relations
Social Media Addiction Test (S-MAT) (Pernsungnern et al., 2014)	No	No	Yes *Loss of control over social media usage and *Excessive use of social media	No	No	No	No	No	No	No	No	Functional impairment
2 Factors												
The Social Media Use Questionnaire (SMUQ) (Xanidis & Brignell, 2016)	No	No	No	Yes	No	No	No	No	No	No	No	Compulsion
Unifactorial: Internet addiction Test (IAT) (Young, 1998)												

\* Specific dimension name.

(a) The definition “conflicts in the social sphere” includes two dimensions: conflict and displacement.

(b) The definition of “loss of control” includes the dimension of tolerance.

(c) The definition of “lack of personal control over social media use” includes two dimensions: conflict and loss of control.

Scales not included for the following reasons.

- Social Networking Status Scale (SNSS) (Arslan & Kırık, 2013): Single-factor scale whose dimension is taken from a multi-factor scale.
- Social media addiction scale for adolescents (SMASA) (Özgenel et al., 2019): No dimensions mentioned.
- The social media usage scale (Küçükali, 2016): Turkish-language scale.

#### 4.1. Analysis of the instruments used to measure problematic SNS use

There were extensive differences in the cut-off points of the scales used to measure the negative use of social networks. Some scales did not propose cut-off points and, therefore, did not allow for the clear distinction between regular and negative use (i.e., problematic or addictive). Some scales, such as the Bergen Facebook Addiction Scale (Andreassen et al., 2012), did not define cut-off points but instead made suggestions; when using such a scale, each researcher establishes a different cut-off point. Finally, in some cases, the cut-off points established by the instrument were not respected (e.g., the Social Media Disorder Scale [van den Eijnden et al., 2016], Internet Addiction Scale [Young, 1998] and Facebook Addiction Scale [Koc & Gulyagci, 2013]).

It is surprising that despite new models have been developed where other factors such as FOMO or metacognitions play a relevant role (Casale et al., 2018), no instrument has been designed to analyse the negative use of social networks encompassing those components among adolescents. The newest theories and models related to addictions such as the Regulatory Executive Function (S-REF) applied to addictions (Spada et al., 2015), those related to technological addictions such as the I-PACE (Brand et al., 2019), the pathway model of problematic smartphone use (Canale et al., 2021), or those that extend theories related to social networks such as dual-system theory (DST) (Turel & Qahri-Saremi, 2016) or the dual-factor model of Facebook use (Nadkarni & Hofmann, 2012) lack assessment tools and are therefore underrepresented in the literature that analyses the negative use of social networks.

It is also worth noting that according to the original six-component model of addiction (salience, mood modification, tolerance, withdrawal, conflict and relapse) postulated by Griffiths (2005), it is necessary for all components to be present in order to affirm the existence of a disorder. However, instruments based on this model incorporated lower cut-off scores that did not align with this condition. Thus, the true prevalence of this hypothetical behavioural addiction may be inflated (Griffiths, 2017). For example, the Bergen Facebook Addiction Scale (Andreassen et al., 2012) included six items, each of which assessed one component. However, the authors suggested using a polythetic scoring scheme, which implies that not all items (in this case, components) are necessary to consider that the disorder exists. In this sense, Griffiths's (2005) original restrictive criteria conflicted with the DSM-5 criteria for Internet gaming disorder, which proposed endorsing five of the nine possible criteria as a cut-off point (American Psychiatric Association, 2013). In the other hand, the ICD-11 did follow a monothetic approach for gaming disorder, so in order to be diagnosed an individual has to endorse all of the four essential criteria (World Health Organization, 2021).

The wide variability of the instruments used and the lack of consensus regarding cut-off points for the assessment of negative SNS use bring to light the obstacles and difficulties that exist regarding the assessment of this specific problem. Notably, the use of commonly agreed-upon cut-off points for the diagnosis of mental disorders serves primarily to facilitate diagnosis and clinical research (Kuss et al., 2014). If research on negative SNS use is to parallel clinical assessments, standardised cut-off points should be applied so that the results can be compared and disseminated.

In this sense, and in order not to overstate the problem, we believe that assessment instruments should guarantee that the dimension or criterion of conflict or negative consequences (understood as significant distress or impairment in personal, family, social, educational, occupational or other important areas of functioning) is measured and endorsed. This criterion is paramount to distinguish between intensive and problematic use of SNSs.

#### 4.2. Analysis of the models and dimensions of measures of negative SNS use

After the scales were analysed, their included dimensions were also

analysed in order to determine from which paradigm each had been created. The definitions were examined; if they were not available, the items of each of the dimensions were examined. Notably, in some cases, the authors failed to define the dimensions and/or did not present the items that comprised them.

In total, 11 dimensions were extracted: conflict, preoccupation, loss of control, withdrawal, mood modification, relapse, tolerance, displacement, deception, POSI and mood regulation. However, no scale assessed all 11 dimensions.

The authors did not establish a common criterion for naming the dimensions (i.e., several dimensions shared the same meaning and measured the same construct but were labelled in different ways). This problem applied to at least eight of the 11 dimensions. For example, the degree to which an individual experienced personal, social, academic or work-related problems as a result of the dysfunctional use of social networks was discussed using various terms (e.g., negative outcomes, decreased function, conflicts in the social sphere, conflict with other activities, etc.). Additionally, the dimension related to obsessive thought patterns related to the use of social networks was referred to in various ways (preoccupation, cognitive salience and behavioural salience, dependency or obsession with social networks, among others).

In addition, it is relevant to highlight the potential conceptual overlap between dimensions, which generates a problem in determining what is being measured. For example, the dimension of 'loss of control' was defined by Vilca and Vallejos (2015) as 'a need to spend more and more time connected to social networks in order to get the same level of satisfaction, resulting in the inability or decreased ability to control their use'. This description intersected with the definition of tolerance, which indicated the need to spend more time connected in order to get the same level of satisfaction. A similar problem occurred with the 'excessive use of social media' dimension described by Estrada-Araoz and Gallegos-Ramos (2020). The authors stated that this dimension 'refers to difficulties in controlling the use of social networks, indicating excessive time use, indicating not being able to control oneself when using social networks and not being able to decrease the amount of social network use'. The latter part of this definition overlapped with the definition of 'relapse', which, again, shows the lack of concreteness of the dimensions.

Tolerance and the loss of control are criteria for determining substance use disorder and are clearly differentiated by the literature in this field. However, this difference could be questioned with respect to social network addiction. According to a multidisciplinary group of experts on behavioural addictions (Petry et al., 2014), tolerance has been measured from different perspectives in other SPIUs (e.g., Internet gaming disorder). For example, some instruments assessed playing longer than expected or feeling unable to stop once starting to play (Petry et al., 2014). In the case of social networks, tolerance was mainly measured from the perspective of spending more time on social networks—did the user feel 'the need to use social media more and more often' or 'regularly [feel] dissatisfied because [he or she] wanted to spend more time on social media'? In the case of online gaming, research has found that some individuals who play longer than expected or who are unable to stop playing once they start a game do not actually have any problems with the game (Petry et al., 2014). These reactions may even occur the first time the game is played and, therefore, do not represent the tolerance that, by definition, requires time and experience to develop (Petry et al., 2014). Therefore, it is worth discussing whether tolerance is inadequately measured in negative social network use, to what extent this measurement might overlap with loss of control and whether, in behavioural addictions, loss of control is a necessary condition to generate tolerance.

Finally, other factors could not be unequivocally classified under particular dimensions, as they addressed multiple concepts within themselves. For example, the virtual communication dimension consisted of items such as 'I usually prefer to communicate with people via social media', which could be related to the POSI dimension, and 'even

my family frown upon, I cannot give up using social media (sic)', which would refer to the 'loss of control' dimension. In the case of the 'virtual problems' dimension, there were items such as 'being on social media excites me', which would fall under the 'mood modification' dimension, and 'I have physical problems because of social media use', which would refer to the 'conflict' dimension. The 'virtual tolerance' dimension used items such as 'I see social media as an escape from the real world', which would refer to the 'mood modification' dimension, and 'I look for Internet connectivity everywhere so as to go on social media', which would refer to 'preoccupation'. The 'negativeness in social relations' dimension used items such as 'I express myself better on social networks', which would belong to the 'POSI' dimension, and 'I feel happy to share my ideas on social networks', which would refer to 'mood modification'. The 'virtual information' dimension did not examine any aspects of the negative use of social networks but, rather, assessed the motivations for using and uses of social networks ('I like using social media to keep informed about what happens').

In short, the negative use of social networks has been examined from a framework of non-standardised definitions and the application of multiple instruments that address different symptoms and constructs (Petry et al., 2014). By emphasising or omitting certain dimensions, the measures developed could be more or less sensitive to some variables. In practice, these differences may lead to inconsistent or even incompatible results, and the construct validity of the scales may be questioned (Tokunaga & Rains, 2016). In any case, what seems evident is that the negative consequences indicated in both the ICD-11 and the DSM-5 should lead us to prioritize the negative consequences in various areas (work, academic and/or personal) of the individual's life.

Even if the results of this review show that the component-based model of addiction clearly dominates the research on SNS use, this model has been inconsistently applied and there is insufficient evidence to support it. In this sense, although the authors of this review have used the term negative use of social networks, we advocate the term "problematic SNS use" to refer to a use of social networks that is detrimental for the user and that can lead to significant impairment or distress in the user's life. Moreover, labels such as excessive use or overuse should be avoided as the criterion of impairment or distress should always be endorsed in order to consider a behaviour as clinically significant and being able to differentiate it from an intensive use.

In light of the results obtained in this scoping review, some recommendations for future research can be made. First, further research is needed to distinguish the components of problematic social network use (Petry et al., 2018) transcending the current traditional six-component model. Second, it will be important to understand, differentiate and establish a consensus on the criteria for problematic social network use in order to categorise it appropriately (Kuss et al., 2014; Petry et al., 2018). Finally, it will be necessary to develop and validate a standardised tool to ensure its utility in research and clinical settings (Kuss et al., 2014). SNS use has spawned an intense social debate, and the lack of clear definitions to characterise it as an addiction might cause unnecessary alarm in some cases.

It should be noted that this scoping review has some limitations. Studies not published in peer-reviewed journals (e.g., theses, book chapters and unpublished reports) were omitted, excluding, by default, grey literature. Despite this, some of the articles included were based on grey literature and were, therefore, reviewed secondarily. Furthermore, although the validity and reliability indicators of the scales were presented, an exhaustive psychometric analysis of the tools was not carried out. Moreover, the terminology associated with the field of social networks is rapidly evolving and heterogeneous. Therefore, a multitude of search terms are available, and potential sources of literature could have been overlooked. Finally, it is relevant to mention that due to the variability and heterogeneity in the research field, it was not possible to conduct a systematic review.

## 5. Conclusion

In summary, the present scoping review on the negative use of social networks in adolescents has shown that, although analysis based on the addiction paradigm predominates, there is no standardised theoretical framework that encompasses the phenomenon of this specific negative use of the SNS. This has led to the creation of multiple tools to assess the problem. Overall, the use of different conceptualisations, assessment instruments and cut-off points severely limits the reliability of the current epidemiological research and calls into question the construct validity of negative social network use measurement tools. Before the field can move forward, other models than the component model of addiction should be tested, and consensus on its defining characteristics must be reached, in order to create reliable and valid instruments to assess the associated problems and harms.

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## CRediT authorship contribution statement

**M.N. Varona:** Conceptualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **A. Muela:** Resources, Supervision, Writing – review & editing. **J.M. Machimbarrena:** Conceptualization, Data curation, Formal analysis, Methodology, Supervision, Writing – review & editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.addbeh.2022.107400>.

## References

- American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders, Text Revision (DSM-IV-TR)* (4th Edition). American Psychiatric Association.
- American Psychiatric Association [APA]. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th Edition). American Psychiatric Association.
- Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook Addiction Scale. *Psychological Reports, 110*(2), 501–517. <https://doi.org/10.2466/02.09.18.PRO.110.2.501-517>
- Arslan, A., & Kirik, A. M. (2013). Validity and reliability study of the social networking status scale. *Journal of Marmara University Social Sciences Institute/Öneri, 10*(40), 223–231.
- Bayer, J. B., Triêu, P., & Ellison, N. B. (2020). Social Media Elements, Ecologies, and Effects. *Annual Review of Psychology, 71*(1), 471–497. <https://doi.org/10.1146/annurev-psych-010419-050944>
- Billieux, J. (2012). Problematic Use of the Mobile Phone: A Literature Review and a Pathways Model. *Current Psychiatry Reviews, 8*(4), 299–307. <https://doi.org/10.2174/157340012803520522>
- Brand, M., Potenza, M. N., & Stark, R. (2022). Theoretical models of types of problematic usage of the Internet: When theorists meet therapists. *Current Opinion in Behavioral Sciences, 45*, Article 101119. <https://doi.org/10.1016/j.cobeha.2022.101119>
- Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T. W., & Potenza, M. N. (2019). The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behaviors: Update, generalization to addictive behaviors beyond internet-use disorders, and specification of the process character of addictive behaviors. *Neuroscience & Biobehavioral Reviews, 104*, 1–10. <https://doi.org/10.1016/j.neubiorev.2019.06.032>
- Canale, N., Moretta, T., Panconi, L., Buodo, G., Vieno, A., Dalmaso, M., & Billieux, J. (2021). A test of the pathway model of problematic smartphone use. *Journal of Behavioral Addictions, 10*(1), 181–193. <https://doi.org/10.1556/2006.2020.00103>

- Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 26(5), 1089–1097. <https://doi.org/10.1016/j.chb.2010.03.012>
- Casale, S., Musicò, A., & Spada, M. M. (2021). A systematic review of metacognitions in Internet Gaming Disorder and problematic Internet, smartphone and social networking sites use. *Clinical Psychology & Psychotherapy*, 28(6), 1494–1508. <https://doi.org/10.1002/cpp.2588>
- Casale, S., Rugai, L., & Fioravanti, G. (2018). Exploring the role of positive metacognitions in explaining the association between the fear of missing out and social media addiction. *Addictive Behaviors*, 85, 83–87. <https://doi.org/10.1016/j.addbeh.2018.05.020>
- Dahl, D., & Bergmark, K. H. (2020). Problematic internet use: A scoping review – longitudinal research on a contemporary social problem, 2006–2017. *Nordic Studies on Alcohol and Drugs*, 37(6), 497–525. <https://doi.org/10.1177/1455072520941997>
- Dalal, P. K., & Basu, D. (2016). Twenty years of Internet addiction... Quo Vadis? *Indian Journal of Psychiatry*, 58(1), 6–11. <https://doi.org/10.4103/0019-5545.174354>
- Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, 17, 187–195.
- Estrada-Araoz, E. G., & Gallegos-Ramos, N. A. (2020). Funcionamiento familiar y adicción a redes sociales en estudiantes de educación secundaria de Puerto Maldonado. *Revista San Gregorio*, 40, 101–117. 10.36097/rsan.v1i40.1393.
- Elphinston, R. A., & Noller, P. (2011). Time to Face It! Facebook Intrusion and the Implications for Romantic Jealousy and Relationship Satisfaction. *Cyberpsychology, Behavior, and Social Networking*, 14(11), 631–635. <https://doi.org/10.1089/cyber.2010.0318>
- Escurrea-Mayaute, M., & Salas-Blas, E. (2014). Construcción y validación del cuestionario de adicción a Redes Sociales (ARS). *Liberabit*, 20(1), 73–91.
- Fioravanti, G., Casale, S., Benucci, S. B., Probst, A., Falone, A., Ricca, V., & Rotella, F. (2021). Fear of missing out and social networking sites use and abuse: A meta-analysis. *Computers in Human Behavior*, 122, Article 106839. <https://doi.org/10.1016/j.chb.2021.106839>
- Fioravanti, G., Flett, G., Hewitt, P., Rugai, L., & Casale, S. (2020). How maladaptive cognitions contribute to the development of problematic social media use. *Addictive Behaviors Reports*, 11, Article 100267. <https://doi.org/10.1016/j.abrep.2020.100267>
- Fioravanti, G., Probst, A., & Casale, S. (2020). Taking a Short Break from Instagram: The Effects on Subjective Well-Being. *Cyberpsychology, Behavior, and Social Networking*, 23(2), 107–112. <https://doi.org/10.1089/cyber.2019.0400>
- Gámez-Guadix, M., Orue, I., & Calvete, E. (2013). Evaluation of the cognitive-behavioral model of generalized and problematic Internet use in Spanish adolescents. *Psicothema*, 23(3), 299–306. <https://doi.org/10.7334/psicothema2012.274>
- Gökdağ, İ., & Kuzucu, Y. (2019). Social Network Addiction Scale: The Validity and Reliability Study of Adolescent and Adult Form. *International Journal of Assessment Tools in Education*, 6(3), 396–414. <https://doi.org/10.21449/ijate.505863>
- Griffiths, M. D. (1996). Internet addiction: An issue for clinical psychology? *Clinical Psychology Forum*, 97, 32–36.
- Griffiths, M. D. (2005). A 'components' model of addiction within a biopsychosocial framework. *Journal of Substance Use*, 10(4), 191–197. <https://doi.org/10.1080/14659890500114359>
- Griffiths, M. D. (2017). Behavioural addiction and substance addiction should be defined by their similarities not their dissimilarities: Commentaries. *Addiction*, 112(10), 1718–1720. <https://doi.org/10.1111/add.13828>
- Hussain, Z., & Griffiths, M. D. (2018). Problematic Social Networking Site Use and Comorbid Psychiatric Disorders: A Systematic Review of Recent Large-Scale Studies. *Frontiers in Psychiatry*, 9, 686. <https://doi.org/10.3389/fpsy.2018.00686>
- Jung, S., & Kim, J. (2014). Development and validation of SNS addiction proneness scale for college students. *Korean Journal of Health Psychology*, 19(1), 147–166. <https://doi.org/10.17315/KJHP.2014.19.1.008>
- Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior*, 4, 351–354. <https://doi.org/10.1016/j.chb.2013.10.059>
- Koc, M., & Gulyagci, S. (2013). Facebook Addiction Among Turkish College Students: The Role of Psychological Health, Demographic, and Usage Characteristics. *Cyberpsychology, Behavior, and Social Networking*, 16(4), 279–284. <https://doi.org/10.1089/cyber.2012.0249>
- Küçükalı, A. (2016). Social media usage of college students: The case of Atatürk University. *Bartın University Journal of the Faculty of Economics and Administrative Sciences*, 7(13), 531–546.
- Kuss, D. J., & Griffiths, M. D. (2017). Social Networking Sites and Addiction: Ten Lessons Learned. *International Journal of Environmental Research and Public Health*, 14, 311. <https://doi.org/10.3390/ijerph14030311>
- Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet Addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design*, 20(25), 4026–4052. <https://doi.org/10.2174/13816128113199990617>
- Lopez-Fernandez, O. (2018). Generalised Versus Specific Internet Use-Related Addiction Problems: A Mixed Methods Study on Internet, Gaming, and Social Networking Behaviours. *International Journal of Environmental Research and Public Health*, 15(12), 2913. <https://doi.org/10.3390/ijerph15122913>
- Machimbarrena, J. M., González-Cabrera, J., Ortega-Barón, J., Beranuy-Fargues, M., Álvarez-Bardón, A., & Tejero, B. (2019). Profiles of Problematic Internet Use and Its Impact on Adolescents' Health-Related Quality of Life. *International Journal of Environmental Research and Public Health*, 16(20), 3877. <https://doi.org/10.3390/ijerph16203877>
- McCrae, N., Gettings, S., & Purrsell, E. (2017). Social Media and Depressive Symptoms in Childhood and Adolescence: A Systematic Review. *Adolescent Research Review*, 2, 315–330. <https://doi.org/10.1007/s40894-017-0053-4>
- Meerkerk, G. J., van den Eijnden, R. J. J. M., Vermulst, A. A., & Vermulst, H. L. F. (2009). The Compulsive Internet Use Scale (CIUS): Some Psychometric Properties. *CyberPsychology & Behavior*, 12(1), 1–6. <https://doi.org/10.1089/cpb.2008.0181>
- Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, 52(3), 243–249. <https://doi.org/10.1016/j.paid.2011.11.007>
- National Institute for Health Research. (2021). PROSPERO: International prospective register of systematic reviews. <https://www.nihr.ac.uk/>. <https://www.crd.york.ac.uk/prosperso/>
- Ostendorf, S., Müller, S. M., & Brand, M. (2020). Neglecting Long-Term Risks: Self-Disclosure on Social Media and Its Relation to Individual Decision-Making Tendencies and Problematic Social-Networks-Use. *Frontiers in Psychology*, 11, Article 543388. <https://doi.org/10.3389/fpsyg.2020.543388>
- Özgenel, M., Canpolat, Ö., & Ekşi, H. (2019). Social Media Addiction Scale for Adolescents: Validity and Reliability Study. *Addicta: The Turkish Journal on Addictions*, 6(3), 631–664. <https://doi.org/10.15805/addicta.2019.6.3.0086>
- Pernsungnern, P., Pornnoppadol, C., Sitthiraksa, N., & Buntub, D. (2014). Social Media Addiction: Prevalence and Association with Depression among 7th-12th Grade Students in Bangkok. *MMO28. Graduate Research Conference*.
- Peters, M. D. J., Godfrey, C. M., Khalil, H., McInerney, P., Parker, D., & Baldini-Soares, C. (2015). Guidance for conducting systematic scoping reviews. *International Journal of Evidence-Based Healthcare*, 13, 141–146. <https://doi.org/10.1097/XEB.0000000000000050>
- Petry, N. M., Rehbein, F., Gentile, D. A., Lemmens, J. S., Rumpf, H.-J., Mölle, T., Bischof, G., Tao, R., Fung, D. S. S., Borges, G., Auriaacome, M., González Ibáñez, A., Tam, P., & O'Brien, C. P. (2014). An international consensus for assessing internet gaming disorder using the new DSM-5 approach. *Addiction*, 109(9), 1399–1406. <https://doi.org/10.1111/add.12457>
- Petry, N. M., Zajac, K., & Ginley, M. K. (2018). Behavioral Addictions as Mental Disorders: To Be or Not To Be? *Annual Review of Clinical Psychology*, 14, 399–423. <https://doi.org/10.1146/annurev-clinpsy-032816-045120>
- Pew Research Center. (2021). *Social Media Use in 2021*. Washington, D.C: Pew Research Center. [https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/04/PI\\_2021.04.07\\_Social-Media-Use\\_FINAL.pdf](https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/04/PI_2021.04.07_Social-Media-Use_FINAL.pdf)
- Pontes, H. M. (2017). Investigating the differential effects of social networking site addiction and Internet gaming disorder on psychological health. *Journal of Behavioral Addictions*, 6(4), 601–610. <https://doi.org/10.1556/2006.6.2017.075>
- Rhee, L., Bayer, J. B., Lee, D. S., & Kuru, O. (2021). Social by definition: How users define social platforms and why it matters. *Telematics and Informatics*, 59, Article 101538. <https://doi.org/10.1016/j.tele.2020.101538>
- Sahin, C. (2018). Social Media Addiction Scale—Student Form: The Reliability and Validity Study. *TOJET: The Turkish Online Journal of Educational Technology*, 17(1), 169–182.
- Schivinski, B., Brzozowska-Woś, M., Stansbury, E., Satel, J., Montag, C., & Pontes, H. M. (2020). Exploring the Role of Social Media Use Motives, Psychological Well-Being, Self-Esteem, and Affect in Problematic Social Media Use. *Frontiers in Psychology*, 11, Article 617140. <https://doi.org/10.3389/fpsyg.2020.617140>
- Spada, M. M., Caselli, G., Nikčević, A. V., & Wells, A. (2015). Metacognition in addictive behaviors. *Addictive Behaviors*, 44, 9–15. <https://doi.org/10.1016/j.addbeh.2014.08.002>
- Tokunaga, R. S., & Rains, S. A. (2016). A Review and Meta-Analysis Examining Conceptual and Operational Definitions of Problematic Internet Use: Problematic Internet Use. *Human Communication Research*, 42, 165–199. <https://doi.org/10.1111/hcre.12075>
- Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, 169, 467–473. <https://doi.org/10.7326/M18-0850>
- Turel, O., & Qahri-Saremi, H. (2016). Problematic Use of Social Networking Sites: Antecedents and Consequence from a Dual-System Theory Perspective. *Journal of Management Information Systems*, 33(4), 1087–1116. <https://doi.org/10.1080/07421222.2016.1267529>
- Tutgun-Ünal, A. (2016). Investigation of social media addiction of university students. *Route Educational and Social Science Journal*, 3(2). <https://doi.org/10.17121/ressjournal.488>
- van den Eijnden, R. J. J. M., Lemmens, J. S., & Valkenburg, P. M. (2016). The Social Media Disorder Scale. *Computers in Human Behavior*, 61, 478–487. <https://doi.org/10.1016/j.chb.2016.03.038>
- Vilca, L. W., & Vallejos, M. (2015). Construction of the risk of addiction to social networks scale (Cr.A.R.S.). *Computers in Human Behavior*, 48, 190–198. <https://doi.org/10.1016/j.chb.2015.01.049>



- We are Social, & Hootsuite. (2022). *Digital 22. Global Overview Report*. We are Social & Hootsuite. <https://wearesocial.com/es/blog/2022/01/digital-2022/>.
- Whiting, P., Savović, J., Higgins, J. P. T., Caldwell, D. M., Reeves, B. C., Shea, B., Davies, P., Kleijnen, J., & Churchill, R. (2016). ROBIS: A new tool to assess risk of bias in systematic reviews was developed. *Journal of Clinical Epidemiology*, *69*, 225–234. <https://doi.org/10.1016/j.jclinepi.2015.06.005>
- World Health Organization (WHO). (2021). *Gaming Disorder*. WHO. <https://icd.who.int/browse11/l-m/en#/http%3A%2F%2Fid.who.int%2Ficd%2Fentity%2F1448597234>.
- Xanidis, N., & Brignell, C. M. (2016). The association between the use of social network sites, sleep quality and cognitive function during the day. *Computers in Human Behavior*, *55*, 121–126. <https://doi.org/10.1016/j.chb.2015.09.004>
- Young, K. S. (1996). Psychology of computer use: XL. Addictive use of the Internet: A case that breaks the stereotype. *Psychological Reports*, *79*, 899–902.
- Young, K. S. (1998). Internet Addiction: The Emergence of a New Clinical Disorder. *CyberPsychology & Behavior*, *1*(3), 237–244.